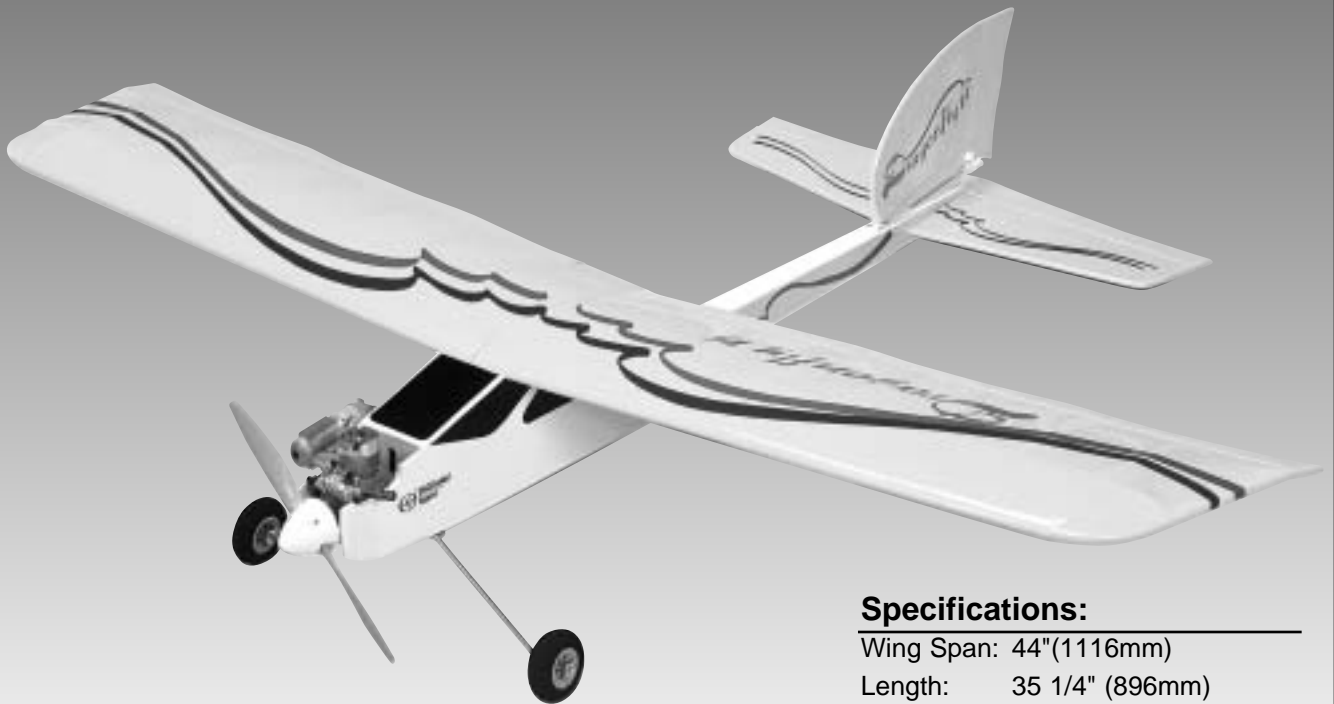


Dragonfly 15

Assembly Instructions



Item No. 4574

Specifications:

Wing Span:	44" (1116mm)
Length:	35 1/4" (896mm)
Weight:	37~40 oz. (1050~1150g)
Engine:	.10~.15 req'd
Radio:	3~4 channel req'd

WARRANTY

Thunder Tiger Model Company guarantees this model kit to be free from defects in both material and workmanship at date of manufacture. This warranty does not cover any components damaged by use or modification and in no case shall Thunder Tiger's liability exceed the original purchase price of the kit. Thunder Tiger also reserves the right to change or modify this warranty without notice.

Since Thunder Tiger Model Co. has no control over possible shipping damages or construction techniques and materials used for construction by the modeler, no liability can be assumed nor accepted for damage resulting from the use by the user of the final user-assembled product. By the act of using this user-assembled product, the user accepts all resulting liability. If the buyer is not prepared to accept this liability, he should return this kit in new and unused condition to the place of purchase for a full refund.

INTRODUCTION

All of us at Thunder Tiger want to thank you for choosing the best looking, easiest building and best flying ARF trainer available the...Dragonfly 15. This kit features state-of-the-art engineering that provides quick and easy assembly of a strong, yet lightweight airplane that will give you an enjoyable and educational experience.

To gain the most from this airplane kit, it is important that you read the instructions thoroughly and then follow them exactly. This instruction manual has been written with a novice modeler in mind, but includes many hints and modeling tips that even experienced modelers can benefit from. We strongly suggest that you read through the instructions completely before beginning construction. This will give you a good idea of the construction sequence and eliminate many questions you might have if you did not read the manual prior to starting the actual construction.

The first thing you should do before beginning assembly is to check the contents of your kit against the parts list on page 4. If any parts are missing, contact your dealer immediately for replacement. Customers in the United States and Canada may contact **Ace Hobby Distributors at 2055 Main Street, Irvine, CA 92614** 1-949-833-7498 for replacement parts. Under no circumstances can a kit be returned if assembly has already been started.

TABLE OF CONTENTS

Introduction	2
Other Items Required	2
Items Need Check List	3
Parts List	4
Pre-Assembly Notes	5
Wing	5-6
Tail Feathers	6
Fuselage	7
Install the Engine	8-9
Control Horn	9-10
Servo Installation	10-12
Radio Adjustment	13
Balance	14
Pre-Flight Check	15
Post-Flight check list	16



OTHER ITEMS REQUIRED FOR ASSEMBLY

A checklist is also provided on the next page which will make shopping for these items easier.



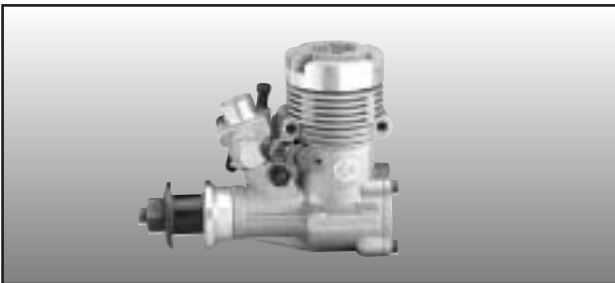
Radio - A 4-channel radio with four standard servos is required. Most lower priced 4-channel radios only come with three standard servos so you may need to purchase the fourth servo separately.



Adhesives - You will need two types of adhesives for the Dragonfly - Epoxy and Instant (cyanoacrylate) adhesives. We recommend that you purchase both 5-minute and 30-minute epoxy to cut down on assembly time, but you can get by with only 30-minute epoxy if time is not important. You will also need a small bottle of both "Thick" and "Thin" instant adhesive.



Tools - Model assembly can be much easier if the proper tools are used. Therefore, we have included in our checklist to the right, a complete listing of all the tools we used to assemble our prototype models. As you will notice, many household tools can be utilized during construction.



Engine - The Thunder Tiger GP-15 is the ideal engine for this airplane. This quiet running engine is easy to start, requires no special break-in periods, is very easy to maintain and will last for years.

Flight Equipment - There are several "support" items that you will need to purchase in order to get your engine running and your plane in the air. These are listed at the bottom of the page.



Comprehensive Items Needed Check List

- 4-Channel Radio with 4 Standard Servos
- 5-Minute Epoxy (4 ounces or so)
- 30-Minute Epoxy (4 ounces or so)
- "Thin" Instant Adhesive (1/2 ounce)
- "Thick" Instant Adhesive (1/2 ounce)
- Hobby Knife and Blades
- Epoxy Mixing Sticks and/or Brushes
- Sandpaper (80, 150 grit)
- Masking Tape
- Rubbing Alcohol
- Paper Towels
- Ruler
- 90 Degree Triangle
- Waxed Paper
- Fine-Point, Felt-Tip Pen
- Misc. Household Tools
- Drill and Bits (1/16", 5/64", 1/8")

Flight Equipment

- Foam Rubber Padding for the radio
- Stick on Lead Strip for balancing the plane
- 3 or 4 Props (see engine instructions)
- 10%-15% Glow Fuel
- Fuel Pump or Bulb
- Electric Starter or "Chicken Stick"
- Glow Plug Clip and Battery
- Extra Glow Plug(s)

PARTS SKETCHES



ORDER BY BAG NUMBER ONLY
INDIVIDUAL PARTS NOT AVAILABLE

AS6271 Main Wing

Left Wing(1) Right Wing(1)

Joiner(2)
Nylon Torque Horn(2)
Wing Protector(1)
Aileron Servo Stand(2) CA Hinge(6)

AS6272 Horizontal Tail

CA Hinge(4) Horizontal Tail(1)

AS6273 Vertical Tail

CA Hinge(2) Vertical Tail(1)

No.3254 Wheel

Wheel(2)

AS6270 Fuselage

Fuselage(1)

Rubber Band(6) Dowel(2) M3 Nut(4) M3 Washer(4) 3x14mm Machine Screw(4) M3 Spring Washer(4)

No.3280W Spinner

2.8x8mm Self Tapping Screw(2)
Back Plate(1) Spinner(1)

No. 3268 Tank

Silicone Tube(1) Straight Nipple (1) Fuel Stopper (1)
Crank Weight (1) Fuel Cap (1) 120cc (4oz.) Tank (1)
90-degree Nipple (1)

AS6275 Linkage Set

Guide Tube(1)
Piano Wire(1)
Aileron Pushrod(2) Clevis(2)

PE0009 Hardware Set

Hex Wrench(1)
EZ Connector(1) M2 Nut(1)
3x3mm Set Screw(1) M2 Washer(2)

AS6276 Main Landing Gear

Main Gear(1)
Collar(2) Brass Tube(2)
Retainer(3) 3x12mm Wood Screw(6) 2.6x5mm Machine Screw(2)

AS6243 Control Horn

Backplate(2)
Control Horn Base(2)
Nylon Torque Horn(2)
2x22mm Screw(2)

AS6274 Nylon Pushrod

Inner Rod(2) Outer Rod(2)
Z bent Threaded End(2) Straight Threaded End(2) Clevis(2)

AS6278 Decal

Decal(1)

PRE-ASSEMBLY NOTE

- ❑ 1.If you are not an experienced R/C pilot, plan to have a fully competent pilot check your completed model and help you with your first flights. Even though we have tried to provide you with a very thorough instruction manual, R/C models are rather complicated and an experienced modeler can quickly check over your model to make sure your first flights are successful.
- ❑ 2.Please assemble your model according to these instructions. Do not attempt to modify or change in any way as doing so may adversely change its flying characteristics.
- ❑ 3.Before you begin, please check the entire contents of this kit against the parts list and photo to make sure that no parts are missing or damaged. This will also help you to become familiar with each component of your plane. If you find that any of the parts are either missing or damaged, please contact your dealer immediately for replacement.

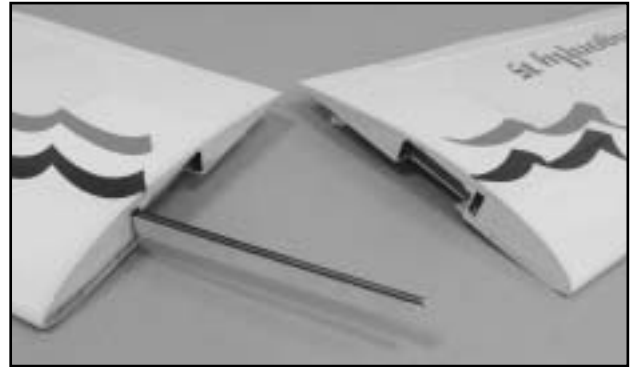
Note: Your dealer cannot accept kits for return if construction has begun.

WING ASSEMBLY



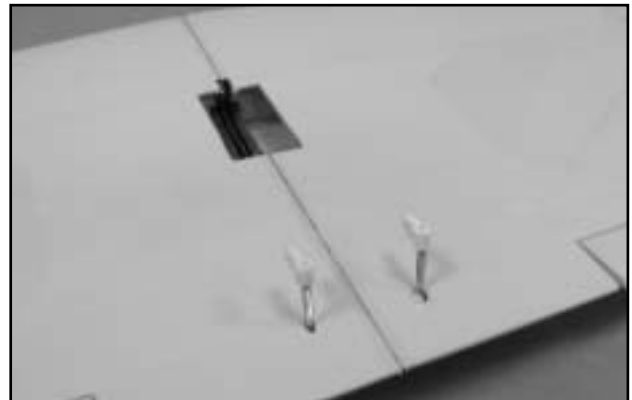
- ❑ 1.Locate two wing joiners and sand gently to remove any rough edges. Apply 5-Minute epoxy or thick CA to glue two joiners together. Clamp the two joiners together using clothespins, or other small clamps and wipe off the excess epoxy before it cures. Allow the epoxy to cure before removing the clamps.

先將主翼中央補強板以AB膠接合並用夾子固定。



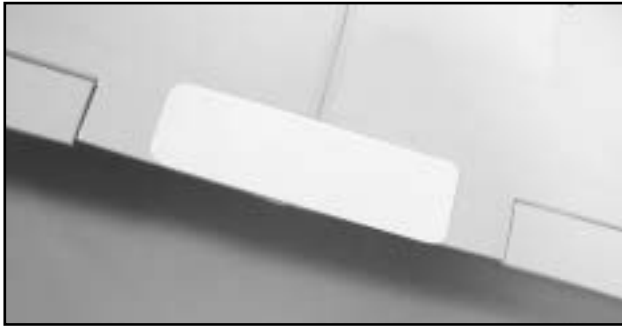
- ❑ 2.Trial fit the wing joiner into one of the wing panels, sand it until it fits smoothly. Next, slide the other wing half onto the joiner until the wing panels meet. Mix approximately three ounces of 30-Minute Epoxy. Note: When joining the wing halves it is extremely important to use plenty of epoxy. Use a mixing stick or scrap piece of wood to apply a generous amount of epoxy into the wing joiner slot of one wing half. Ensure that the epoxy is applied to all sides of the slot.

試著搭配主翼接合槽若搭配過緊請以砂紙砂磨。



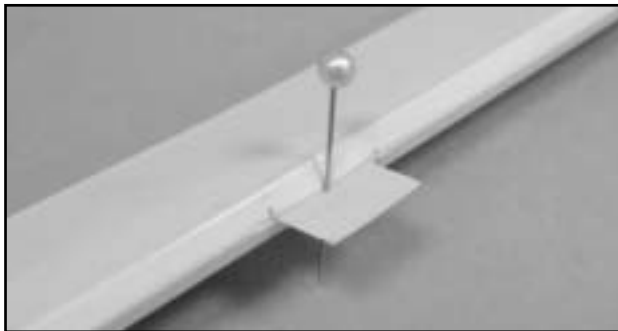
- ❑ 3.Coat one half of the joiner with epoxy up to the centerline. Install the epoxy-coated side of the joiner into the wing joiner slot, making sure that the joiner is positioned correctly. Lightly coat the epoxy on all sides of the exposed area of joiner and wing roots as well as the slot of the other wing half. Carefully slide the wing halves together, ensuring that they are accurately aligned. Firmly press the two halves together and wipe off the excess epoxy. There should not be any gap between the wing halves. You might wisely use mask tape to hold the wing together. Allow the wing joint to cure.

確認沒有問題後使用30分鐘AB膠接合，接合時需在接合面施以適當壓力直到AB膠硬化固定。



- ❑ 4. Locate the plastic wing protector plate and lightly sand the edges on one side of the plate by 80-grit sandpaper. Center the plate across the wing joint and flush with the trailing edge then glue with thick CA.

將後緣補強片以砂紙磨粗表面，然後與後緣切齊並以瞬間接著劑固定主翼中央接合線。



- ❑ 5. To hinge the ailerons, remove the clear tape that holds one of the ailerons in place. Pull the aileron off the wing, revealing three hinges. Position the hinge in the center by a ball pin or T pin.

在活頁中央使用大頭針穿過以定位活頁。



- ❑ 6. Attach the aileron to the trailing edge, remove all pins then drop thin CA to the hinges at both sides.

安裝副翼後拔掉所有大頭針並在活頁位置兩面以瞬間膠固定。

TAIL FEATHERS



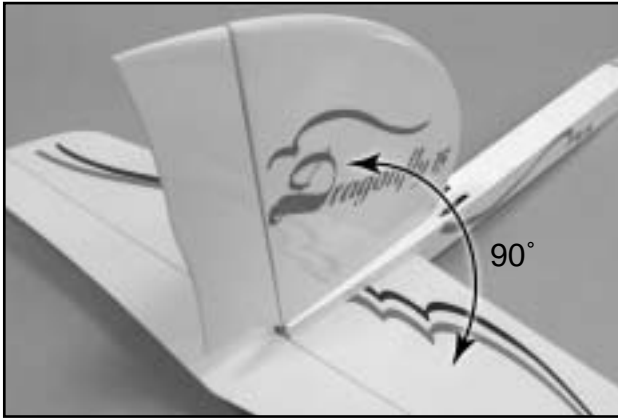
- ❑ 7. Use the same way as you did on aileron to glue the rudder and elevator on the tails. Using a hobby knife, carefully cut out the covering at the center of horizontal tail slot. The vertical tail will later be inserted into this slot. Install the tail on the fuselage. Use a felt tip pen or marker to draw lines along the fuselage sides as well as the bottom side of horizontal tail.

將尾翼固定於機身上沿機身在尾翼上以細麥克筆做出記號。



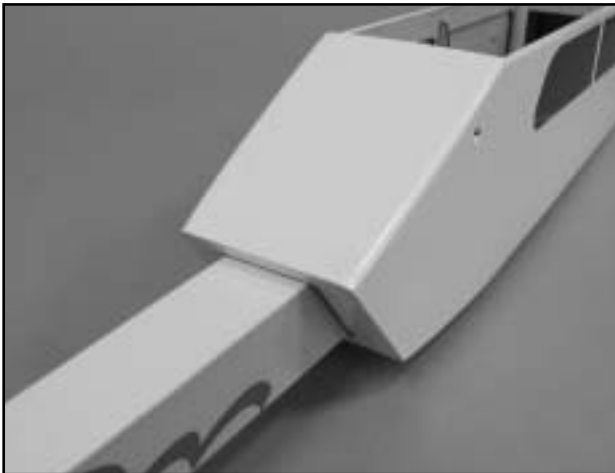
- ❑ 8. Remove the tails from the fuselage and use a hobby knife to carefully score the covering material where marked. Make the score approximately 1/16" (1.5mm) inside the lines you drew. It is very important that you do not press hard enough to cut into the wood itself or it may fail in flight. Just score the covering and it will peel away nicely.

使用銳利的美工刀沿記號保留1.5mm左右將包覆紙去除，須小心勿傷及木質的部份。



- 9. Apply 5-Minute Epoxy or thick CA onto the horizontal tail and vertical tail along the area where the covering were removed. Attach the horizontal tail and vertical tail onto the fuselage. Note, it is important to ensure that the horizontal tail is level in regards to the fuselage and the vertical tail is perpendicular to the horizontal tail as shown. Wipe off any excess epoxy and secure by masking tape. Allow the epoxy to cure completely.

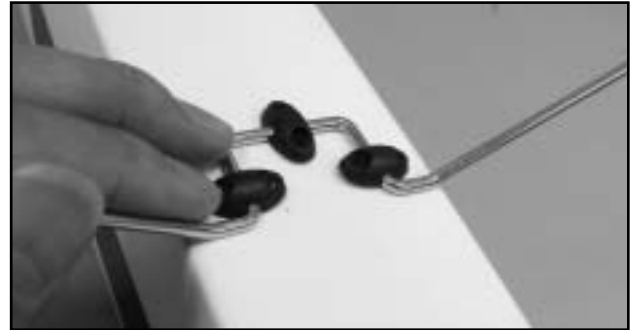
使用AB膠固定尾翼並確認水平與垂直尾翼角為90度。



- 10. Trail fit the tail assembly to the fuselage. Remove the covering at the contact area then apply enough 5-Minute Epoxy to the contact area inside the fuselage and do not move it until it cured.

將接合部位包覆紙去除並將整個機尾組以足量AB膠接合固定於前段機身上。

LANDING GEAR



- 11. Locate the main landing gear and the three retainers. Place the landing gear and retainer on the fuselage bottom as shown. Make marks on the retainer holes. (About 5" away from the nose).

取出腳架及腳架固定片,如圖示距離機身底部前端約7cm處在腳架固定片孔位做記號。



- 12. Drill 1/16"(1.5mm) holes on the marks you made.

以小手鑽在記號處鑽2mm的孔並以固定螺絲將腳架固定。



- 13. Screw the landing gear with the furnished six 3x12 wood screws. Insert the brass tube to the wheel first then secure the collar with 2.6x5mm set screw. Make sure the wheels rotates freely.

安裝銅軸套及輪胎並用輪檔以螺絲固定。



- 14. Locate the four pre-drilled wing dowel holes, two on either side of the fuselage. Using a sharp hobby knife, carefully cut the covering away from each of the holes. Insert one of the wooden dowels into each of the wing dowel holes. Ensure that an equal amount of dowel extends from each side of the fuselage. You might apply a thin coat of epoxy to the wing dowels to prevent the dowels from becoming fuel-soaked during flight.

安裝竹棒於機身上並以瞬間接著劑固定。

FUEL TANK



- 15. Locate the fuel tank and the fuel tank accessories. Assemble the fuel tank by first cutting the silicone tube to 2" (53mm) in length. Press the straight plastic nipple (the 90-degree nipple is not used in this plane) into the rubber stopper until the molded-in ring is against the stopper. Rubbing alcohol applied to the nipple will make it slip into the stopper easier. Now slip the silicone tubing onto the nipple and insert the metal clunk into the other end of the tubing. Insert this assembly into the tank (clunk first) and securely tighten the threaded cap on to hold everything together. Note: It is important to ensure that the fuel tank clunk does not touch the rear of the fuel tank. If it

does, simply cut a small portion of the fuel tubing until the clunk no longer reaches the rear of the tank.

如圖示安裝油箱組，注意重錘不得與油箱內後板面接觸。



- 16. Cut two 5" (12cm) long of standard size silicone fuel tubing (not furnished) and slip one end onto the nipple extending out of the cap and the other onto the top vent of the fuel tank. Slide the fuel tank (cap end first) into the fuselage from the wing saddle area, threading the fuel lines through the oblong hole in the firewall. The tank should fit tightly in the forward formers.

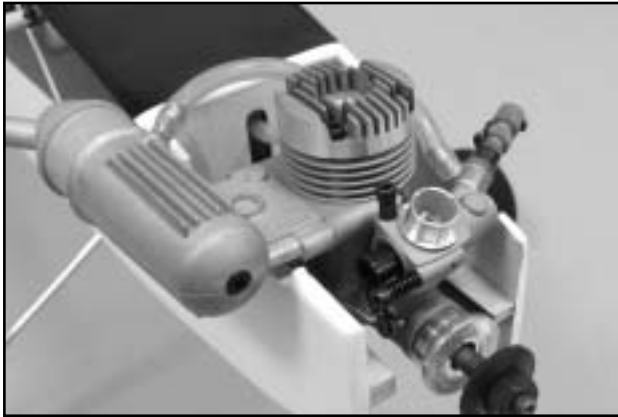
加裝油管(12公分長)2條並將油箱固定於機身內，油管通到引擎並注意油管不得折曲。

ENGINE



- 17. Position the engine on the engine mount beams so the distance from the prop hub to the firewall is exactly 3 1/2" (89mm). Using a pencil or felt tipped pen, mark the engine mounting plate where the four holes are to be drilled. Note: Mark the mounting plate through the engine mounting flanges. Remove the engine and drill a 1/8" (3mm) hole through the beam at each of the four marks.

將引擎置於引擎座上，驅動墊圈與防火壁約89mm處在引擎孔位上做記號，然後在記號上鑽3mm孔。



- 18. Using a Philips screwdriver, firmly secure the engine by four 3x14mm machine screw, M3 spring washers, M3 washer and M3 nuts. Install the muffler as per the instructions included with the engine. Connect the vent tube from the fuel tank to the nipple, or pressure fitting, on the muffler. The remaining fuel tube should be attached to the carburetor inlet nipple.

以螺絲、華斯、彈簧華斯及螺帽來固定引擎，安裝上消音器並連接油管，注意油管何為進氣口何為進出油口。



- 19. Remove the propeller nut and prop washer from the engine. Install the spinner back plate on the crankshaft, followed by the propeller, the prop nut and finally the spinner nose cone. Securely attach the spinner nose cone to the spinner back plate using the two screws provided in the hardware bag and a Philips screwdriver.

安裝機頭罩及螺旋槳。



- 20. Locate the plastic pushrod tube through the pre-drilled hole in the firewall of the fuselage until approximately 1/2"(1.5mm) of the tube protrudes from the firewall. Secure the tube with 5-Minute Epoxy. Locate a Z bent throttle pushrod, Slide the wire, straight end first, into the pushrod tube. Insert the Z bent into the hole on the throttle lever of your engine. Note: It may be easier to temporarily remove the throttle lever from the engine to insert the Z bent end.

將油門套管以AB膠固定於防火壁上，將油門控制桿z字頭部分與引擎油門擺臂連接，必要時得將擺臂拆下以利安裝。

CONTROL HORNS



- 21. Locate the linkage rods include straight threaded end, Z bent threaded end, nylon inner rod. Thread the nylon rod onto the straight thread end first as shown. At least 3/8"(9mm) in length.

將尾翼控制連桿、塑膠內管組合，組合時至少要有9mm 以上。



- 22. Insert the pushrod to the holes on former, the lower one is elevator pushrod and the other is rudder pushrod. Attach the plastic clevises at least 1/4" (6mm) in length.

將連桿穿過機身於尾翼前穿出並安裝連桿頭，組合時至少要有6mm 以上。



- 23. Turn the fuselage over and place one of the control horns on the bottom of the elevator. Hold the control horn against the bottom of the elevator so it is approximately 1/8" (3mm) behind the hinge line and in line with the pushrod exit hole. Using a felt tipped pen or a pencil mark the mounting hole positions. Remove the control horn and drill two 5/64" (2mm) holes through the elevator as shown.

沿連桿推力線在升降舵及方向舵面上距活頁折合線3mm處鑽2mm的孔。



- 24. Attach the control horn using the hardware provided (2x22mm screws, back plate, control horn base and nylon horn) and fasten in place using a Philips screwdriver. Make sure the back plate and control horn base are both in line at two sides on the elevator. Thread the nylon horn on to the screw then snap the clevis onto the horn.

安裝升降舵及方向舵之舵角控制器。

SERVO INSTALLATION



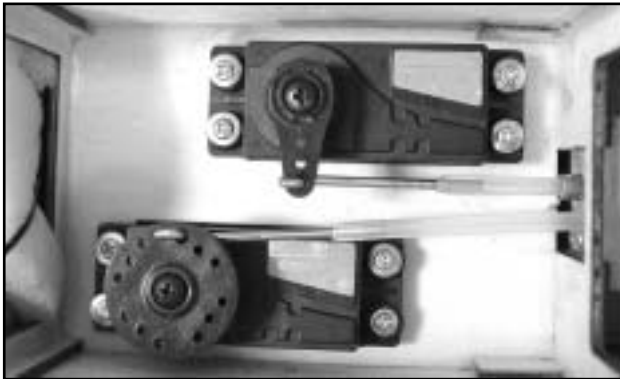
- 25. Thread the Z bent threaded end to the nylon inner rods as shown. Before you thread, it might need to cut the nylon rod as it is too long. Note the servo orientation in the next step. Refer to the photo, make sure you thread the Z bent threaded end to the nylon rod for 3/8" (9mm) in length and the Z bent end is about at the position of servo horn where is going to link.

安裝z字頭連桿於塑膠內管，注意z字頭位置於安裝後與伺服機擺臂位置相對應。



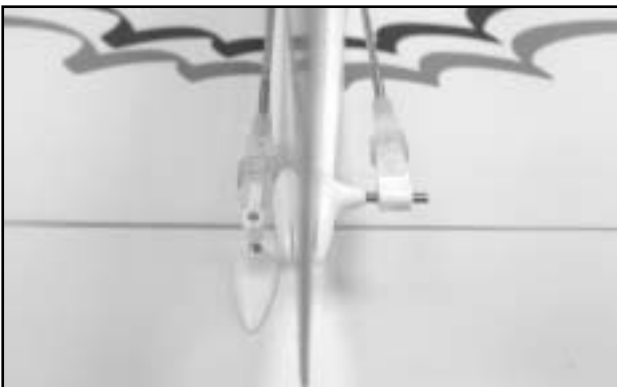
- 26. Refer to manual of radio then install the rubber grommets and eyelets which come with your servos. Secure the servo with the servo screw as shown. Attach the Z bent end to the servo horn. With radio is on and centered, adjust the pushrod length either by threading the clevis or Z bent threaded end so the elevator is level when servo is in neutral position with servo horn installed.

固定升降舵伺服機並將z字連桿頭安裝於伺服機擺臂上並於伺服機中立位置調整升降舵面與水平尾翼切齊。



- 27. Same procedure on rudder servo. We recommend you use the servo arm instead of round servo horn on rudder servo.

同樣方式安裝方向舵伺服機及連桿。



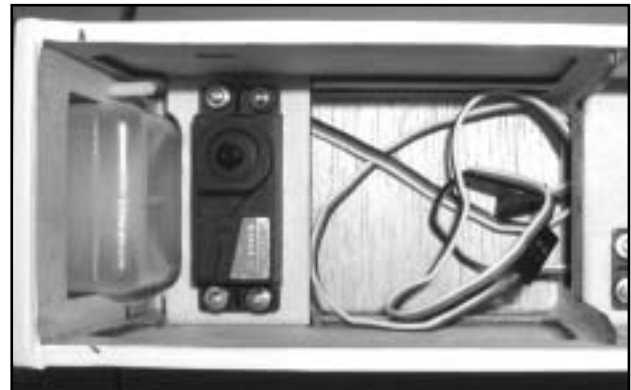
- 28. When everything is set, slip a short piece of fuel line over all clevises to prevent them from snapping open in flight.

如圖示，套一小段矽膠管在塑膠拉桿頭上以防止飛行時脫落。



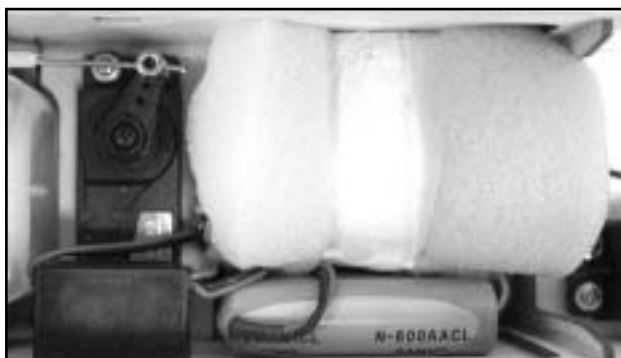
- 29. Locate the EZ connector set which includes 3x3mm set screw, two M2 washers, m2 nut and an EZ connector. Install the connector on the servo arm as shown. It might need to enlarge the hole on servo arm to make sure it rotates freely. It is wisely to apply little CA to the M2 nut from losing.

如圖示在伺服機擺臂上安裝拉桿快速接頭。



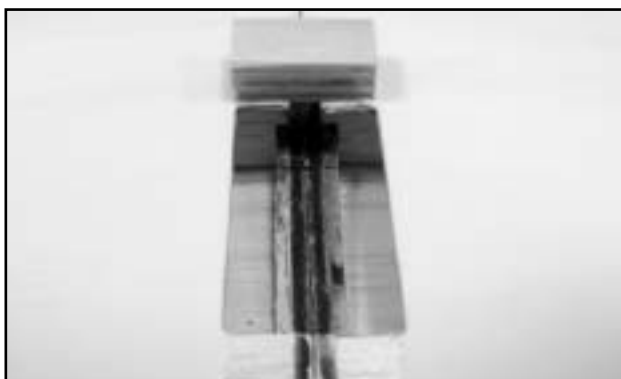
- 30. Align the pushrod tube with the throttle servo. To prevent any possible binding, the pushrod tube should be shortened so it does not interfere with the servo arm travel. Using a sharp hobby knife, cut the pushrod tube accordingly. Insert the pushrod wire through the pushrod connector. Secure the pushrod in place using a 3x3mm set screw.

將油門鋼絲穿過快速接頭後將擺臂固定於伺服機上按第12頁圖示做引擎油門調整，完成後將油門鋼絲固定。



- 31. The switch should be mounted on the left side of the fuselage, using a sharp hobby knife carefully cut the opening for the switch. Detach the switch plate from the receiver switch harness. Using the switch plate as a template, Drill the two mounting holes using a 5/64" drill bit. Secure the switch in place as shown. Route the antenna back through the fuselage or route it outside the fuselage back to the vertical tail.

安裝開關組及安置電池及接收機。天線可從機身底部穿出到機身尾部以膠帶固定。



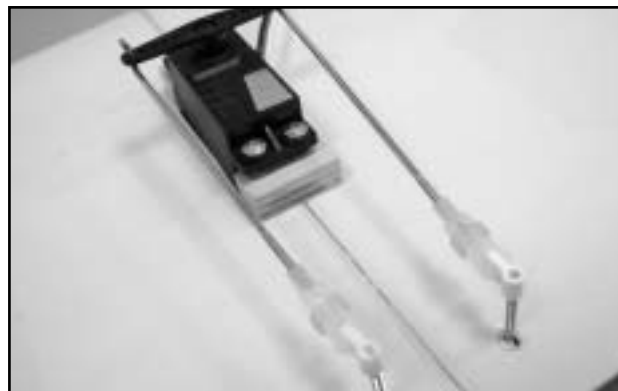
- 32. Locate two aileron servo stands. Remove the covering where is going to glue the stand as shown. Apply 5-Minute Epoxy to the aileron servo stand. Remove any excess epoxy and allow epoxy to cure.

移除副翼伺服機座安裝地方的包覆紙、再用AB膠固定伺服機座在主翼上。



- 33. Install the rubber servo grommets and eyelets in the aileron servo. Next, secure the aileron servo in place as illustrated.

安裝副翼伺服機於伺服機座上。



- 34. Locate two aileron torque rod horns, two long Z bent threaded aileron pushrod and two clevises. Thread the horns on aileron torque rod until the threaded portion is flush with aileron torque rod horn. Next, thread the clevises on pushrod. With the aileron servo horn in its neutral position, insert the Z bent end of two pushrods to servo arm. Snap clevises onto aileron torque rod horns. Adjust the clevis to make sure two ailerons are level with trailing edge. Thread a small piece of fuel tube to hold clevis.

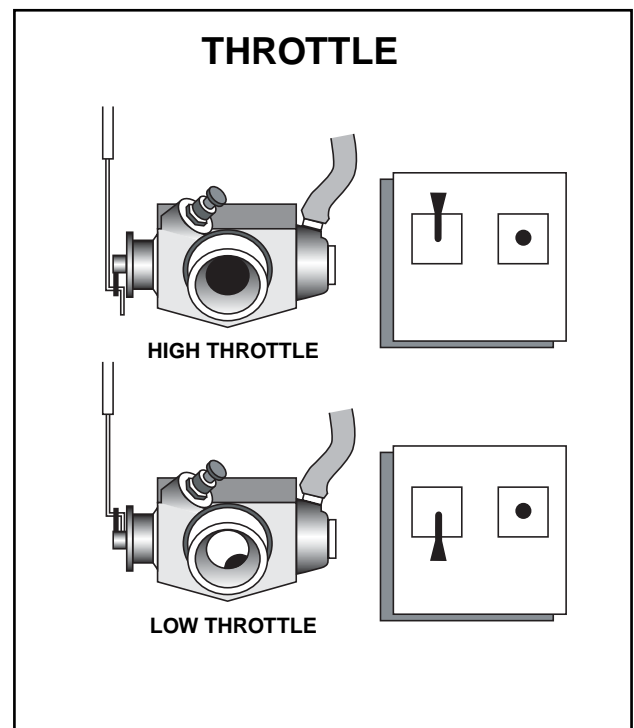
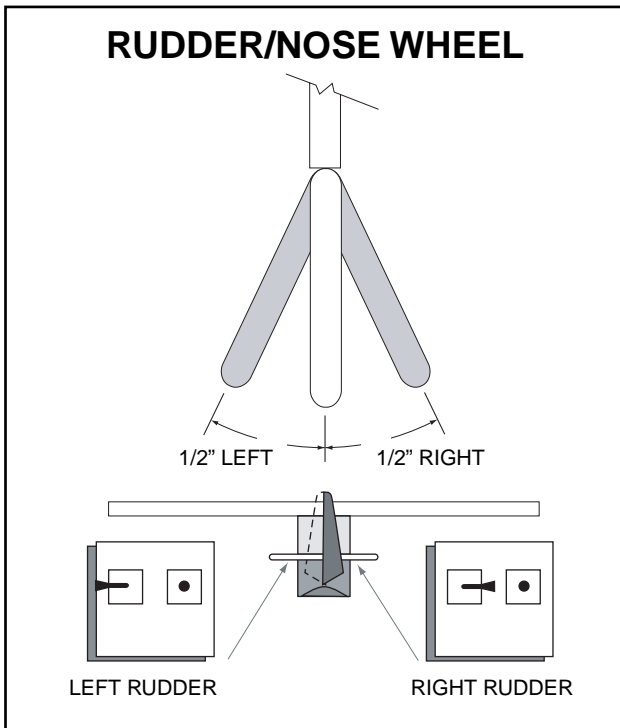
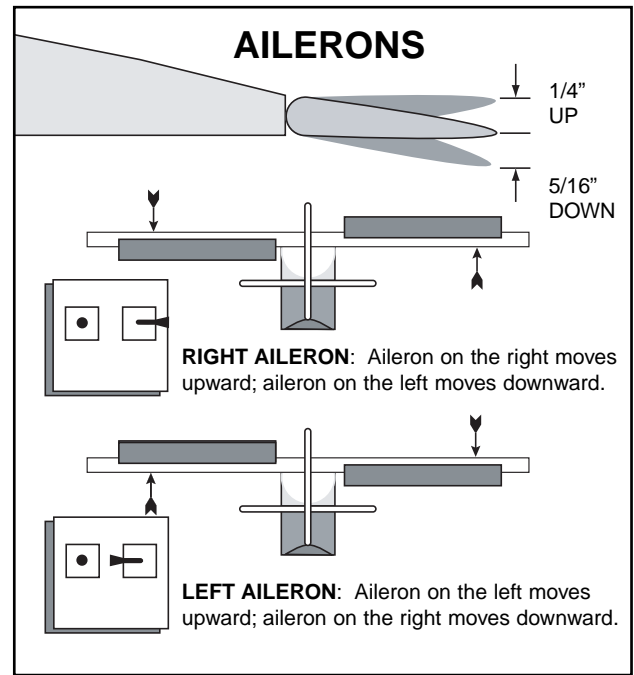
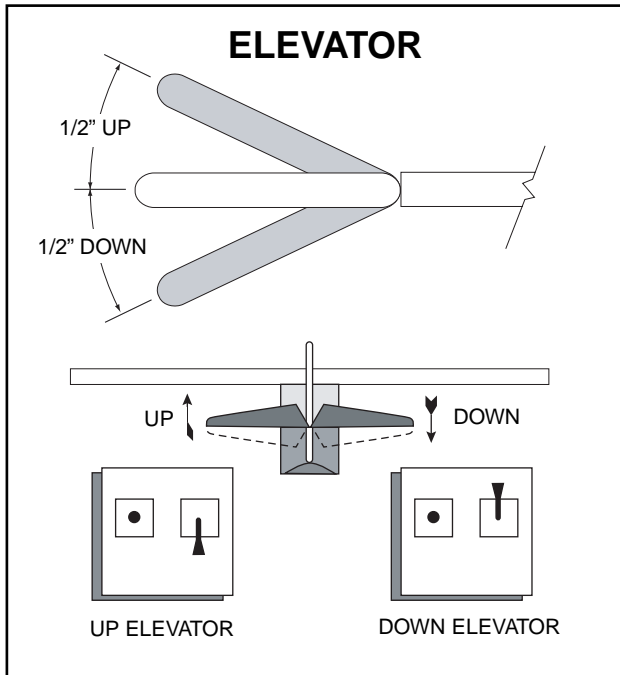
安裝副翼拉桿及連桿頭並套一小段矽膠以防止飛行時脫落。

Congratulations

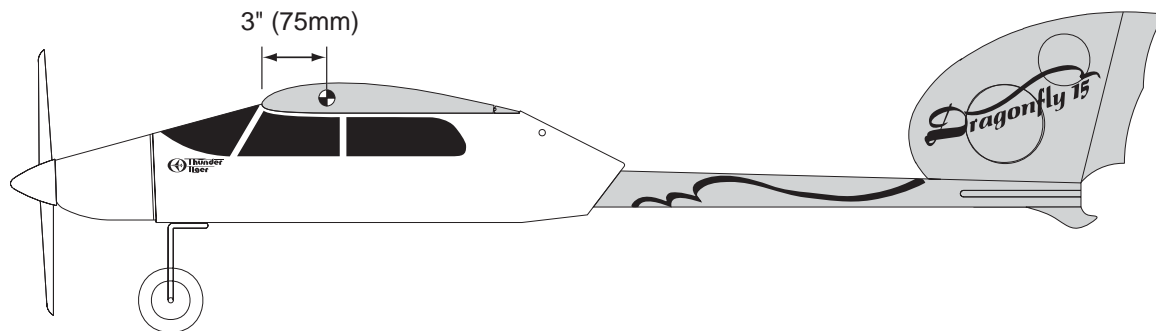


You are ready to fly. Don't forget to balance your plane and fine tune the all control surfaces.

恭喜您，您的飛機即將完成請進行重心位置、各伺服機動作幅度及方向確認動作及調整。



□ Adjust the linkages so you get the proper amount and direction of control throws as illustrated. To INCREASE the amount of movement, move the linkage outward on the servo arm OR inward on the control horn. To DECREASE the amount of movement, move the linkage inward on the servo arm OR outward on the control horn.



BALANCING YOUR PLANE

IMPORTANT- Do not attempt to fly your model before completing this very important section. A model that is not properly balanced will be unstable and could cause serious damage and/or injury.

The balance point for this model is 3"(75mm) behind the leading edge of the wing. Measure this distance and mark it on both sides of the fuselage right under the wing. With your model fully assembled but without fuel, pick it up with your index fingers at each of the two balance marks you made earlier. If balanced properly, the plane will hang horizontally. If the plane hangs with the tail down, then you need to add (or redistribute) some weight in the nose. Usually the plane will either balance or hang slightly tail heavy. The easiest cure for a tail heavy plane is to move the receiver and battery forward as far as possible. If the plane hangs nose down, then you need to add some weight to the tail. Stick-on lead weights are available from your hobby dealer that will make adding weight a simple task. Once you have everything positioned as necessary, wrap your receiver and battery pack in 1/4" or 1/2" thick foam for protection.

PRE-FLIGHT

If you are an experienced pilot, some of the following text will not apply to you. Simply disregard references to "your first flights."

LOCATE A GOOD FLYING SITE

Generally, the best place to fly your model is at an **AMA** (Academy of Model Aeronautics) chartered club field. Your local hobby dealer can tell you if there is such a club in your area or write the AMA for information. It is also a good idea to join this organization before flying your model since they offer liability insurance that can protect you if your model causes damage or injury to others.

Academy of Model Aeronautics
5151 East Memorial Dr.
Muncie, IN 47302-9252

If there is not a chartered club field in your community, you will need to find a large area free of obstructions, that has a smooth grass or asphalt surface to be used as a runway. For safety's sake, it should be located well away from houses, building, schools, power lines and airports. If you will be flying within 6 mile of an airport, you should check with the airport manager before flying your model.

A NOTE ON BATTERIES

The batteries are the heart of your radio system. Make sure you have fully charged batteries! With rechargeable batteries, follow the manufacturers instructions to make sure the batteries are fully charged, especially the first time the radio is used.

If your radio uses dry cells, make sure your batteries are in new condition. You have a lot of money invested in this project so it is not worth the risk of using old batteries.

PRE-FLIGHT CHECKS

You should perform these checks before each flying session.

- 1. Check all control surfaces for possible looseness or deterioration.
- 2. Check all screws, rubber band, clevises, nuts and all other connectors to make sure they are securely fastened.
- 3. Check which radio frequencies are being used. Do not turn on your radio until absolutely sure you are the only one operating on that frequency.
- 4. Check for proper operation of all control surfaces.
- 5. Check the level of charge in both the transmitter and receiver batteries before flying.
- 6. Range check the radio both with and without the engine running! Follow the radio manufacturer's instructions for this.

FLYING

Learning to fly a radio control aircraft can be very exciting, but it is important that you thoroughly understand the basics of flight and controls before you attempt your first flights. Therefore, we highly recommend that you seek the expertise of an experienced instructor pilot for the first few flights. He (or she) can get you in the air much more smoothly than trying everything yourself for the first time. Specially this plane is not good for taking off from the ground. It is better have experienced modeller to launch the plane and test the plane for you.

GETTING ORIENTED

The first and most important thing to remember when controlling model aircraft is: the model controls are set up to operate as if you were sitting in the cockpit of the model. This means that when you pull back (down) on the elevator stick the nose of the plane will go up. Moving the rudder stick to the right will "yaw" the plane to the right and moving the aileron stick to the right will "roll" the plane to the

right. Pretty simple right? Well, not quite. Since you are really standing on the ground and not sitting in the plane, this is how the controls work when you are facing the same direction the plane is flying. The problem is that when the plane is flying towards you, the rudder and aileron controls seem reversed to the inexperienced pilot. This is the reason we recommend that you practice taxiing around in a large open area to try and get used to the control reversal.

During your first few flights, try to face the direction that the plane is flying and looking over your shoulder as needed. This makes it a little easier to pretend that you're sitting in the cockpit.

FIRST FLIGHT

When you are comfortable with the controls, you should be ready for your first flight. Go over the Pre-Flight Check List one more time for good measure. Point the model directly into the wind at full throttle. Launch the plane against the wind by another experienced modeller. As the model starts rolling forward it may try to turn to the left due to the engine torque. Apply enough right rudder to keep the plane rolling relatively straight into the wind. If you built the model with right thrust, this tendency may not be noticeable. As the plane picks up speed, the right rudder input can be reduced.

Once the plane reaches flying speed and height, it will probably try to fly by itself. It is always important that you do not apply too much up elevator too early or the plane will stall and roll over into the ground.

As the plane becomes airborne, reduce the "up" elevator and allow the plane to pick up flying speed while gently gaining altitude. Once a safe flying speed and altitude has been obtained, feel free to turn the airplane back toward the flying field. Make all control inputs smoothly and gradually so you can see the effect they have on the plane. A small amount of "up" elevator will need to be applied to keep the plane level during turns. You should be able to reduce the throttle to about 1/2 throttle for normal cruising flight which will reduce the flying speed and give you more time to think about what is going on. You will find that once airborne, you can fly the plane with only the aileron and elevator sticks. This is perfectly fine and will make it much easier for you to learn.

If the plane has a tendency to turn, roll, climb, or dive, you can adjust the transmitter trims to correct this. On your first flights, it might be a good idea to

have an experienced pilot make the adjustments for you while you fly the plane.

If you get disoriented or the plane gets out of control, simply take your hands off all the controls and allow the plane to stabilize. Clear your head and try to picture yourself sitting in the cockpit. Then input the required control movements to get the plane back on the correct flight path. If you run out of time or flying space and realize the plane is going to hit something (ground, tree, etc), pull the throttle back to idle and pull the elevator stick back about half way. This will reduce the speed of the plane and minimize the damage sustained.

When you are ready to land, do a couple of slow fly-bys at a safe altitude to get familiar with the plane's slow-flying characteristics. An important factor to remember here is that you should regulate your altitude with the throttle not the elevator as you might expect. Practice raising the nose of plane slightly with a touch of "up" elevator and then using the throttle to regulate the plane's altitude. When you are ready to land, fly downwind past the runway. When the plane is a hundred yards or so downwind, reduce the throttle to almost an idle and turn 90 degrees towards the runway. Fly straight for a second or two until the plane is almost even with the runway. Turn 90 degrees again and fly directly toward the runway using the throttle to govern how quickly the plane is descending. Keep the nose of plane up slightly with the elevator and allow the plane to fly gently onto the runway. Do not try to stretch the glide path without increasing the throttle or the plane may stall.

POST-FLIGHT CHECK LIST

- 1. Be sure that both the transmitter and receiver switches are turned off.
- 2. Drain all excess fuel from the tank. Fuel left in the tank for extended periods can "gunk up" the tank, fittings and carburetor.
- 3. Clean the plane with paper towels and a light-duty spray cleanser. Keeping your plane clean will make it last longer and keep it looking nice.
- 4. Put a few drops of after-run or light oil in the carburetor and turn the prop over a few times (without the glow plug ignited) to distribute the oil throughout the engine.
- 5. Inspect the prop and replace it if any chips or cracks are found.
- 6. Inspect the entire plane for covering tears, new dings and dents, loose screws and connectors and any other wear and tear.
- 7. Use a voltmeter to check the receiver battery voltage. If it is low, you now know not to fly so long next time. If it is still high, you should be able to fly a little longer next session.

SAFETY PRECAUTIONS

1. Wear safety glasses when starting and running all model engines.
2. Model engine fuel is very flammable and the flame is very dangerous because it is almost invisible! Do not smoke or allow sparks, high heat or other flames near the fuel.
3. Do not run model engines inside a garage or other closed room as they give off large amounts of deadly carbon monoxide gas.
4. Do not run model engines around gravel, sand or other loose debris. These materials will be ingested through the carburetor and can also be kicked up by the prop.
5. Always stay behind the propeller when the engine is running. Make all engine adjustments from behind the engine. Under no circumstances should you allow your face or body near the plane on rotation of the propeller when the engine is running.
6. Do not allow loose clothing or other loose objects close to the prop.
7. To stop an engine, cut off the fuel or air supply to the engine. Do not throw rags or other objects into the prop to stop the engine.
8. Do not touch the engine or muffler during or right after it has been running—it gets very hot!
9. If you hear any unusual noises while your plane is flying, land at once and determine the problem before returning to the air. Control surface flutter, which often emits a low-pitched "buzz", can quickly destroy an airplane and should not be ignored. Flutter is usually caused by sloppy control surfaces and is generally relatively easy to cure.